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ABSTRACT

Cumulative grade-point averages (GPAs) of all two- and four-year public and private college transfers who graduated from the University of North Carolina at Chapel Hill during the academic year 1974-75 were compared with those of native students after controlling for academic aptitude through a multivariate analysis of covariance procedure. No significant differences in GPAs exist between native and two-year transfer students; but four-year transfer students had significantly higher GPAs than native students. It is concluded that there is merit in the argument that lower division programs in four-year colleges add appreciably more "value" than comparable programs in other institutions. (Author/MSE)

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The "Value-Added" Effects of Two- and Four-Year Lower Division Curriculum Programs

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Abstract

Cumulative GPAs of all two-and four-year public and private college transfers who graduated from UNC-CH during the academic year 1974-75 were compared with those of native students after controlling for academic aptitude through a multivariate analysis of covariance procedure. No significant differences in cumulative grade point averages exist between native and two-year transfer students; but four-year transfer students had significantly higher grade point averages than native students. We conclude that there is merit in the argument that lower division programs in four-year colleges add appreciably more "value" than comparable programs in other institutions.

The "Value-Added" Effects of Two- And Four-Year Lower Division Curriculum Programs

The American system of higher education is composed of a wide range of colleges and universities which profess to offer considerable diversity in their curricular programs. However, as Astin (1968) has noted, most institutions of higher learning profess to pursue a common goal of excellence. One tenet in higher education is that intellectual development is best nurtured at so-called "high quality" institutions. This assumption is supported by the fact that the graduates of our leading universities are generally more successful occupationally than the graduates of lesser colleges. Thus, it follows that the former institutions add more "value" to the lives of students who attend them than the latter institutions add to the lives of their students. A flaw in this reasoning becomes evident upon recognition that the best students intellectually, socially, and economically, attend the leading schools. Thus, if an institution initially obtains the highest quality material (students) through a selective admissions procedure, and does not alter this material in a detrimental fashion, then it is reasonable to expect that the "finished product" will be of highest quality as well. However, is this "product" a consequence of "schooling," or a consequence of the quality of "input"?

This question assumes more than merely academic importance in a period of the "steady state," where some institutions are closing their doors, and where others are desperately concerned with maintaining enrollments. In four-year colleges, and particularly in independent four-year colleges, admissions officials publicize the advantages of students attending an institution characterized by a faculty, many (or most) of whom have doctorates,

unencumbered with "publish or perish" requirements in fulfilling their teaching responsibilities. Spokesmen for two-year colleges, particularly when arguing for increased funding, have maintained that their faculties can and have overcome the inherent instructional problems caused by the enrollment of a widely diverse student body (Blocker et al, 1965; Cohen, 1969; French, 1974; and Monroe, 1972). In contrast, numerous scholars (Dressel, 1963; Mayhew, 1969; and Patterson & Longworth, 1966) have voiced concern over the apparent lack of interest by major universities in good teaching, particularly at the undergraduate level. For example, Dennis and Kauffman (1969), raise the issue of part-time graduate students providing a significant portion of instruction in undergraduate education at universities. McGrath (1966), notes that such use of graduate students reflects the universities' emphasis on research over teaching. A consequence, according to some scholars, is that lower division courses are not as well taught in the university as elsewhere (Riesman, Gusfield, and Gamson, 1971).

The purpose of this paper is to explore the question of the relative "value-added" effects of curricular programs in two- and four-year, public and private, institutions. We will begin by briefly reviewing the research which compares the academic performance of two- and four-year college transfers to universities.

Review of Literature

Two-year college advocates cite the voluminous research (well over one hundred studies) which supports the contention that two-year college transfer students do quite well after transferring to senior institutions even when these students would not have met the entrance requirement criteria of the senior colleges as freshmen (see Harmon, 1976, for a general description and listing of these studies). Even so, they still, on the average, do not do as well as "native" students, i.e., those students who did matriculate

as freshmen in the senior institutions. However, as noted above, this finding may be explained by the fact that the average academic aptitude of two-year college transfers is not as great as that of native students. This explaration, of course, supports the contention found in the two-year college literarure that these colleges, being student-oriented and staffed with a teaching-oriented faculty, are thereby able to effectively prepare students to be successful in an institution where they were initially denied entrance.

Research comparing the performance of four-year college transfers to the performance of native students is much more limited, and may be characterized by mixed results. For example, Melnick (1970) and Wermers (1973) found that grade point averages of natives and four-year college transfers were not significantly different. On the other hand, Kelley (1970) and Johnson (1965) found that four-year transfers had higher grade point averages than native students. Mann's (1963) Oklahoma study produced the opposite result, i.e., natives' averages were greater than four-year transfers' averages. In all of these studies, the grade point average of four-year college transfer students was higher than that of two-year college transfer students.

Relatively few studies have employed a design which controlled for initial academic aptitude (e.g., high school grades, SAT scores, college major) when making comparisons in academic achievement at the university. In fact, we could only locate seven studies concerning transfers which used this design. In six of the seven studies we were able to locate, academic performance of transfer students equalled that of native students after aptitude was controlled (Brady, 1971; Davidson, 1965; Henderson, 1972; Nickens, 1970; Sutton, 1969; and Wermers, 1973). In only one study (Jones, 1966) was it found that natives' grade point averages were significantly higher than both two-year and four-year transfers' grade point averages after apitude

(high school rank and SAT scores) was controlled. It should be noted, however, that Jones used a rather limited group of transfers (those who graduated on time and who majored in physical science or mathematics) as opposed to a general sample of all transfers, as did most studies.

Given the paucity of research which controls for initial differences in aptitudes, the relatively mixed findings of that research, and the limited populations of these studies, we consider it important to compare the performance of two-and four-year public and private transfer students with that of native students at a major university. If the curriculum of either the two- or the four-year lower division programs provide superior education, i.e., adds more value, we would expect that the performance of these transfers would be significantly better after the effects of academic aptitude have been removed. The following section describes the design and methodological considerations in our study.

Method

The population of this study consists of those University of North Carolina at Chapel Hill (UNC-CH) students who received their baccalaureate degrees during the 1974-75 academic year (N = 2,994). The total number of transfers in this population was 625. After eliminating those transfers who did not attend UNC-CH for approximately one-half of their degree program, this number was reduced to 29 transfers from public two-year colleges, 129 transfers from private two year colleges, 149 transfers from public four-year colleges, and 124 transfers from private four-year colleges. A 25% per cent random sample of native students (N = 2,369) resulted in a sample of 601 students.

Data necessary for hypothesis testing was obtained through the cooperation and assistance of the Office of Records and the Office of the Registrar at UNC-CH. A preliminary analysis of this data comparing academic indicators

for native and the various categories of transfer students shows that native students had a higher mean rank in high school and higher SAT scores than any category of transfer student, and a higher final two-year mean grade point average at UNC-CH than two year transfer students, but this average was slightly less than that for four-year college transfer students (see Table 1).

Insert Table 1 about here

A separate multivariate analysis of variance was performed to compare the mean differences between two-year public and two-year private grade point averages and between four-year public and four-year private averages to see if significant differences existed between the group means. The difference between the two-year mean averages was not significant [$F(4,1024) = 1.744$, $p < .138$] nor was the difference between the four-year mean averages [$F(4,1024) = 1.400$, $p < .232$]. Therefore, we conclude that there are no significant differences between public and private two-year college transfer students nor between public and private four-year college transfer students, thereby enabling us to combine these four categories into two: two- and four-year transfer students.

To explore the central question of this paper, i.e., are there differences in the "value-added" effects of curricular programs in two-year colleges, four-year colleges, and universities, we will first use one-way multivariate analysis of variance F tests to compare mean grade point average differences in the three groups for each of the final four semesters at UNC-CH, and then use a three-way multivariate analysis of covariance to remove the effects of initial academic aptitude and other variables which may account for differences in academic achievement other than curricular program by type of institution.

Results

A series of one-way multivariate analyses of variance F tests comparing mean grade point averages for each of the final four semesters between each of the three categories of students found the following: mean grade point averages of two-year college transfers were significantly less than mean averages of natives $[F(4,1024) = 5.061, p < .001]$ and significantly less than mean averages of four-year college transfers $[F(4,1024) = 6.782, p < .001]$. No significant difference was found between mean grade point averages of four-year college transfers and native students $[F(4,1024) = 1.329, p < .257]$.

As stated above, a three-way multivariate analysis of covariance may be used to control for initial differences among groups. The covariates selected for this study are high school rank, SAT verbal score, and SAT math score. These covariates were entered into the statistical equation in order to partial out the effects of initial inequalities in academic ability, prior to comparing academic performance of the three groups at UNC-CH. In addition to the factor of college origin, two additional variables observed earlier to be correlated with academic performance (and valid predictors of such), sex and major, were utilized as factors in the analysis to test not only the main effects of the central factor, but also to test for any interaction effects which may account for a significant portion of the total variance.

As may be noted in Table 2, no significant differences were found for

Insert Table 2 about here

sex $[F(4,886) = 2.112, p < .007]$, but significant differences were found for major $[F(4,886) = 3.28, p < .001]$. In all four semesters considered, the highest averages were attained by language and humanities majors, followed in order by mathematics and science majors, and then by business and related majors. Testing for any interaction effects, we analyzed sex by major, sex

by college, major by college, and sex by major by college. No significant interactive effects were found, thus allowing direct interpretation of the main effects.

Therefore, we find that there are no significant differences between the adjusted means of two-year transfers and natives [$F(4,886) = 0.414$, $p < .799$], or between four-year transfers and two-year transfers' adjusted average [$F(4,886) = 2,212$, $p < .066$]. However, the adjusted grade point averages of four-year transfers were significantly higher than the mean adjusted averages of natives [$F(4,886) = 5.454$, $p < .001$].

Discussion

Before discussing our findings, it is important to acknowledge the limitations of this study. For example, we used only the records of those students who graduated during a single academic year, 1974-75. While there is no reason to believe that this graduating class was dissimilar from other recent graduating classes, this study makes no attempt to establish similarities or differences between classes. However, one might project the possibility that the 1974-75 graduating class is reasonably representative of other graduating classes for the past few and next several years.

Another limitation evident in the design of this study is that only students who graduated from UNC-CH were considered in the population. Students who graduate from other universities and who may have had different characteristics were not included. However, it would appear reasonable to assume that students who attend major state universities would share similar characteristics with UNC-CH students, and that the findings of this study may have a degree of generalizability to these institutions. Generalizability would be strengthened in cases where university admissions policies, socio-economic characteristics, population distributions, and state patterns of higher education are similar to those of UNC-CH.

A third limitation rests in the fact that only those transfer and native students who eventually graduated were considered in this study. Those students who failed to graduate were unaccounted for, although the study did account for transfers and natives who took longer than the normal time to complete their degree. No attempt was made to ascertain the number of transfer or native students who failed to graduate at all.

One final limitation needs to be mentioned; that only transfers in regular degree programs were considered, and one- and three-year transfers were eliminated. No attempt was made to include these students, nor was any effort made to analyze their academic performance.

Subject to these limitations, it would appear that educational programs offered by two-year colleges, both public and private, are successful in their attempts to prepare their students to meet the academic demands of universities. Although two-year college transfer students score lower on aptitude tests and other indicators used to predict academic achievement, they do as well as native students when these differences are removed. Indeed, considering initial differences in academic ability, the two-year college experience appears to have been as beneficial to two-year college students as attendance in the lower division program of the university has been to natives. We cannot say, however, that the curriculum of two-year colleges adds more "value" to students than does the lower division academic curriculum of the university. Indeed, it may be that the two-year college transfer programs are only acting as "filters" which identify those students who would have been successful in lower division university programs had they attended them initially, even though they had failed to qualify originally. As Birnbaum (1970) notes, college "predictor variables" are based on probability tables which are reasonably accurate, but clearly not perfect, and, therefore, many students with lower aptitude scores are quite capable

of university work even though they would not originally be accepted for initial admission.

Such is not the case with lower division programs of four-year colleges. Here, although four-year transfer students had lower aptitude scores, they made essentially the same grades as natives, and, when initial academic differences and such variables as sex and major were considered, they did significantly better. This finding provides evidence that experiences in the lower division curriculums of four-year colleges adds "value" in comparison to experiences in the curriculums of two year colleges or of UNC-CH. Unfortunately, we must regard this study as exploratory. It will take further research to investigate and isolate the crucial variables which can account for adding "value" to undergraduate educational experiences.

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Table 1

Academic Indicators for Native and Transfer Students[a]

Type of Institution	N	Mean Rank in High School	Mean SAT Math	Mean SAT Verbal	Mean Final Two-year GPA at UNC-CH
Native UNC-CH	601 (100%)	Top 15%	579	549	3.02
Transfer	431 (100%)				
Two-year Public	29 (7%)	Top 31%	503	476	2.83
Two-year Private	129 (30%)	Top 30%	481	468	2.79
Four-year Public	149 (34%)	Top 22%	534	520	3.09
Four-year Private	124 (29%)	Top 22%	543	521	3.07

Table 2

Significance Levels from Three-Way (Sex by Major by College) Multivariate Analysis of Covariance

Source and Contrasts	Probability Levels for Multivariate F on GPAC*	Univariate F's on GPA1	GPA2	GPA3	GPA4
Sex	.077	.660	.960	.449	.009
Major	.001	.004	.001	.007	.104
College (Three Levels—Native, Two-Year Transfer, Four-Year Transfer)	.002	.002	.001	.001	.015
Two-Year Transfer vs. Native	.779	1.000	.516	.904	.523
Two-Year Transfer vs. Four-Year Transfer	.066	.023	.028	.011	.021
Sex by Major	.523	.381	.266	.846	.626
Sex by College	.342	.390	.283	.458	.597
Major by College	.671	.849	.554	.778	.786
Sex by Major by College	.076	.575	.116	.738	.109

*GPAC = Two year cumulative grade point average,
GPA1 = First semester grade point average,
Etc.